

A FURTHER REFERENCE TO THE OCCURRENCE OF *MERISTA*  
*PLEBEIA* SOWERBY IN NEW SOUTH WALES.

By JOHN MITCHELL, late Principal of the Newcastle Technical College and  
School of Mines, N.S.W.

(Plate liii.)

[Read 24th September, 1924.]

The present reference to my record of the presence of *Merista plebeia* Sowerby in Australian rocks (These Proceedings, xlv., 1920) has been brought about by the attitude assumed towards that record by Professor W. N. Benson, of the University of Otago, N.Z. Professor Benson (Rec. Geol. Surv. N.S.W., x., Pt. 2, 1922) omitted my record of *Merista plebeia* from his extensive list of Australian Devonian fossils. Thereupon I wrote and drew his attention to the omission of this important Middle Devonian fossil, thinking at the time that the omission had been an accidental one. Professor Benson, in a courteous reply, informed me that the omission referred to had been intentional; because he considered that my determination was incorrect. Subsequently when a verbal discussion on the subject took place between us, he suggested that I had mistaken some Carboniferous brachiopod for a *Merista*. I therefore decided to submit duplicates of the brachiopods which had been determined by me as *Merista plebeia* Sowerby to an authority whose qualifications were beyond question and, in January last, I wrote to Dr. John M. Clarke, Director of New York State Museum, explaining to him the points in dispute between Professor Benson and myself, and asking him to act as arbiter between us. In his reply, Dr. Clarke makes the following remarks:—

“(1) *Merista plebeia* from the Eifel and elsewhere in the middle Devonian shales is, as a rule, a longer shell and a typical *Merista*; that is to say, its ‘shoe-lifter’ process is a single plate unsupported by a median septum.

“(2) The genus *Dicamara*, introduced by myself (Hall and Clarke, Palaeontology of New York, Vol. 8, Part ii., p. 73, Pl. 42, figs. 13-16), has a median septum supporting this central plate so that the umbonal chamber of the ventral valve is divided into two compartments.

“(3) *Dicamara scalprum* (F. Roemer) from the Middle Devonian of the Rhine, often in association with *Merista plebeia*, has this peculiar structure, and is the type of the genus. In it I can see no distinction from your species in structure or in form, I am disposed to believe that your species is identical with it.

“In a miscellaneous collection of specimens commonly referred to *Merista plebeia*, one would be quite likely to find specimens of *Dicamara scalprum*. In

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“In a miscellaneous collection of specimens commonly referred to *Merista plebeia*, one would be quite likely to find specimens of *Dicamara scalprum*. In

fact this is the way in which the latter came to my attention as a distinct generic form and there is, therefore, good ground for your having identified your own species with *M. plebeia*."

The above opinion and explanations by Dr. Clarke are not likely to be challenged and leave little to be added by me.

However, it may be pointed out that before the establishment of the genus *Dicamara* J. M. Clarke, *Dicamara scalprum* was known as *Merista scalprum* F. Roemer and generally accepted to be identical with *Merista plebeia* Sowerby. Further, I was quite aware, that ultimately the fossil under discussion would be placed in the genus *Dicamara*, as the following remarks, in my rough copy of the original description of it, go to show: "It may happen later that additional evidence will prove the present form to belong to the genus *Dicamara* J. M. Clarke, for as stated above, there is a median septum in the brachial valve." The classification of our Meristoid fossil will now be as follows:—

Family MERISTELLIDAE Hall and Clarke.

Genus DICAMARA J. M. Clarke, 1894.

DICAMARA SCALPRUM F. Roemer.

Syn. *Merista plebeia* mihi (*non* Sowerby), These Proceedings, xlv., 1920, 544-5, Pl. xxxi., figs. 1-3.

To Dr. John M. Clarke my very sincere thanks are tendered for his kindness in undertaking the office of arbiter to settle the points of divergence placed before him; and for his examination and classification of the fossils submitted to him.

It has occurred to me that further proof of the Devonian age of the rocks from which *Dicamara* (*Merista*) *scalprum* was obtained might, appropriately, be added here, and consequently I add descriptions of three small Spirifers and an *Athyris* which in my opinion possess a true Devonian facies and which were found associated with *Dicamara* (*Merista*) *scalprum* Roemer.

SPIRIFER TULCUMBAHENSIS, n.sp. (Pl. liii., figs. 1-3.)

Shell of medium size, subrhomboidal or subpentagonal. Pedicle valve strongly convex, sulcus wide, shallow; ribs fourteen or more in number on each side of the medial fold, smooth, mildly convex, their obliquity laterally increases very gradually; interspaces shallow concave and equal in width to the ribs; beak prominent, incurved; umbonal ridges curved and reach the cardinal angles; cardinal area large, elevated and concave; cardinal angles rounded (?), dental plates conspicuous; delthyrium large and seems to be closed by the deltidium. Brachial valve subsemicircular, less convex than the other one, beak fairly prominent; medial fold low, indefinitely separated from the adjoining radials; in ornamentation it agrees with the ventral valve. When the outer lamellate layer of the shell is removed the valves are seen to be covered with fine radial striae, similar to those under similar conditions observed on the valves of *Martiniopsis subradiata* from Lower and Upper Marine beds (Permo-Carboniferous); but no concentric striae are visible on either valve. Dimensions: Length, 18.0; width, 20.0; depth, 12.0 mm.

The characteristic features of this Spirifer are (1) the thin flaky outer layer of the test, (2) longitudinal striae visible after removal of the surface lamellae, (3) indistinctness of the radials at and near their origin, (4) absence

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of concentric striae, (5) faintness of the radials. The species has a decided Devonian aspect.

As far as I have been able to ascertain the *Spirifer* most closely related to the present species is *S. tullius* Hall from the Hamilton group (Devonian) of U.S.A. They agree in the following: (1) High cardinal area; (2) Plications rather flattened and low; (3) Whole surface covered with radial striae; (4) Sinus and fold extending quite to the beak, and smooth but for the fine radial striae. The local species differs from the other in (1) Having a weakly defined fold and sinus, (2) rounded cardinal angles (?), (3) curved umbonal ridges on the ventral valve, (4) terminal of the medial fold and sinus protrusive instead of emarginate, (5) lacking concentric striae, (6) greatest width some distance ventrally from the cardinal angles (?), (7) much smaller size.

On the foregoing differences the local form is separated from the American one.

*Loc.*—One of the foothills of the Bulga (an old volcanic vent) near the Bulga homestead, Parish of Gunnenbene, County Nandewar, N.S. Wales, associated with *Dicamara scalprum* F. Roemer (= *Merista plebeia*, Mitchell, non Sowerby), and *Orthis (Schizophoria) striatula*.

*Horizon.*—Middle Devonian.

*SPIRIFER GUNNENBENENSIS*, n.sp. (Pl. liii., figs. 4-6.)

Pedicle valve subrhomboidal, strongly convex or arched, slopes steeply from the beak to the lateral margins; ribs on each side of the sulcus are nine or ten, the pair bounding the sulcus being much stouter and more prominent than any of the others, all are convex and moderately prominent; concentric striae numerous, equally spaced and imbricate the radials; sulcus moderately deep, begins at the tip of the beak, concave, rounded in front; umbo prominent, high, and mildly incurved; cardinal area triangular, high, concave and reaches the cardinal angles; delthyrium narrow, partially closed by the deltidial plates. Brachial valve strongly convex, but less so than the pedicle, semicircular; radials similar to those of the pedicle valve; fold prominent, narrow, very definitely separated from the radials by pronounced furrows; beak inconspicuous. It may be added that the radials of both valves have a decided curve towards the lateral margins. Dimensions of two of the largest pedicle valves known: Length, 16.0, 15.0; width, 16.0, 15.0; depth, 8, 7.5 mm. A brachial valve measured 12.0 mm. long, 16.0 wide and 4.0 deep approx., and a small specimen with valves in apposition 11.0 long, 11.0 wide and 8.0 mm. deep.

The chief features of this species are (1) approximate equality of length and width, (2) proportionate great depth, (3) prominent radials abutting upon the sulcus, (4) high and prominent umbo, (5) prominent and curved umbonal ridges of the ventral valve, (6) radials rather strongly curving towards the lateral margins and (7) distinct separation of the fold of the brachial valve from the radials by pronounced furrows.

Locality and horizon the same as for the preceding species.

*SPIRIFER WOODHOUSEI*, n.sp. (Pl. liii., figs. 9-11.)

Whole shell small. Pedicle valve subrhomboidal, very strongly convex, especially towards the umbo, pyramidal. Radials five on each side of the sulcus, the fifth being faint; the sulcus pronounced and triangular; beak prominent, mildly incurved, pointed and suberect; umbonal ridges bow-shaped and just

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On the foregoing differences the local form is separated from the American one.

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Pedicle valve subrhomboidal, strongly convex or arched, slopes steeply from the beak to the lateral margins; ribs on each side of the sulcus are nine or ten, the pair bounding the sulcus being much stouter and more prominent than any of the others, all are convex and moderately prominent; concentric striae numerous, equally spaced and imbricate the radials; sulcus moderately deep, begins at the tip of the beak, concave, rounded in front; umbo prominent, high, and mildly incurved; cardinal area triangular, high, concave and reaches the cardinal angles; delthyrium narrow, partially closed by the deltidial plates. Brachial valve strongly convex, but less so than the pedicle, semicircular; radials similar to those of the pedicle valve; fold prominent, narrow, very definitely separated from the radials by pronounced furrows; beak inconspicuous. It may be added that the radials of both valves have a decided curve towards the lateral margins. Dimensions of two of the largest pedicle valves known: Length, 16.0, 15.0; width, 16.0, 15.0; depth, 8, 7.5 mm. A brachial valve measured 12.0 mm. long, 16.0 wide and 4.0 deep approx., and a small specimen with valves in apposition 11.0 long, 11.0 wide and 8.0 mm. deep.

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reach the rounded cardinal angles; area relatively large and concave; delthyrium narrow and open. Brachial valve semicircular; radials similar in number and other respects to those of the pedicle valve; medial fold prominent, triangular in section; beak prominent. This valve is much less convex than the other one; traces of concentric striae are visible on both valves. Dimensions: Length, 9.0; width, 11.0; depth, 7.0 mm.

The striking features of this *Spirifer* are (1) its relatively large area, (2) prominent beaks, (3) bow-shaped umbonal ridges of the pedicle valve, (4) prominent and triangular sectioned medial fold and its definite separation from the radials, (5) the great depth, compared with the length and width of the whole shell. The shell here described is testless, and slightly damaged on one side; but for these imperfections it is a good specimen and unfortunately is singular.

The present species will fall into Hall and Clarke's division Radiati and group Pauciplicati of that division. The *Spirifers* belonging to this group, for the greater part, occur in Upper Silurian and Devonian rocks. It is therefore reasonable to assume that the present species is of Devonian age. This assumption is practically confirmed by its occurrence in association with *Dicamara scalprum* Roemer.

The species is dedicated to Mr. Woodhouse, at one time teacher of the public school at Gunnenbene and who, while on a visit to the Bulga with the writer, collected the specimen which forms the type of the species.

ATHYRIS BULGAENSIS, n.sp. (Pl. liii., figs. 12-14.)

Outline of complete shell pentagonal or subdiscoidal, each valve about equally convex; pedicle valve shorter than wide (11:12); radials absent; concentric striae distinct, evenly spaced and imbricated; a shallow sulcus develops towards the ventral margin; umbo subtumid; foramen distinct. Brachial valve slightly shorter than the pedicle one, but in other respects the two are similar except that on the brachial valve, owing to the removal of the outer layer of the test, the concentric striae are invisible; no median fold present. Dimensions: Length, 11.0; width, 12.0; depth, 8.0 mm.

This species is a neat one. In dimensional proportions and in some other respects it resembles *A. cora* Hall from the Hamilton group, Delphi, N.Y., but is only half the size of that species, and in some other respects differs from it.

Loc. and horizon: The same as for the preceding species, and is named after the homestead on which it was collected.

EXPLANATION OF PLATE LIII.

*Spirifer tulcumbahensis* Mitchell.

1, 2, 3. Views of the pedicle, brachial and front aspects (x 1.5, 1.5 and 2 respectively).

*Spirifer gunnenbenensis* Mitchell.

4, 5, 6. Views of a brachial valve and two pedicle valves, each more or less incomplete (x 2).

*Spirifer* sp. indet.

7, 8. Pedicle and brachial aspects (x 2 approx.).

reach the rounded cardinal angles; area relatively large and concave; delthyrium narrow and open. Brachial valve semicircular; radials similar in number and other respects to those of the pedicle valve; medial fold prominent, triangular in section; beak prominent. This valve is much less convex than the other one; traces of concentric striae are visible on both valves. Dimensions: Length, 9.0; width, 11.0; depth, 7.0 mm.

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4, 5, 6. Views of a brachial valve and two pedicle valves, each more or less incomplete (x 2).

*Spirifer* sp. indet.

7, 8. Pedicle and brachial aspects (x 2 approx.).



*Spirifer woodhousei* Mitchell.

9, 10, 11. All showing the brachial aspect. Fig. 11 is a rough drawing of the shell restored. It shows the radials too distinctly (x 2).

*Athyris bulgaensis* Mitchell.

12, 13, 14. Pedicle, brachial and front aspects. The brachial valve, owing to the removal of the outer layer of the test, appears to be smooth (x 2).

All the specimens here figured are in the writer's collection.

A PRELIMINARY REFERENCE TO A NEW SPECIES OF *ELONICHTHYS*  
FROM THE LOWER BEDS OF THE NEWCASTLE COAL MEASURES.

By JOHN MITCHELL, late Principal of the Newcastle Technical College and  
School of Mines, N.S. Wales.

(Plate liii.)

[Read 24th September, 1924.]

*ELONICHTHYS DAVIDI*, n.sp. (Pl. liii., fig. A.)

The present remarks merely form a preliminary introduction to the description of the above species by Dr. A. Smith Woodward, to whom the original specimen of the fossil fish is being sent for that purpose. Already a good photograph of the fossil has been submitted to Dr. Woodward, who, at the writer's request, very generously determined its generic position as given above. In his letter conveying this information, Dr. Woodward further remarked that the species was new, and that it could be dedicated to Professor Sir Edgeworth David with safety, as this was the expressed wish of the writer. Dr. Woodward adds: "It must be one of the finest specimens of *Elonichthys* known."

As far as the writer is aware the above species is more ancient than any fossil fish yet recovered from rocks of Permian age in New South Wales.

*Loc.*—Near the junction of the Newcastle Coal Mining Company's railway with the Great Northern Railway of N.S. Wales, Parish of Tarro, County Northumberland.

*Horizon.*—About two hundred feet below the Borehole seam of the Newcastle Coal Measures. This horizon may be considered as belonging either to the lower beds of the Newcastle measures, or to the upper beds of the Dempsey Island division (David) of our upper Permian rocks.

## EXPLANATION OF PLATE LIII. A.

*Elonichthys davidi*, n.sp.. (x ½).

*Spirifer woodhousei* Mitchell.

9, 10, 11. All showing the brachial aspect. Fig. 11 is a rough drawing of the shell restored. It shows the radials too distinctly (x 2).

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## EXPLANATION OF PLATE LIII. A.

*Elonichthys davidi*, n.sp.. (x  $\frac{1}{2}$ ).